

2040 Freight: Greenhouse Gas Reduction Best Practices



Community Advisory Committee 10/14/21



PBOT
PORTLAND BUREAU OF TRANSPORTATION

Agenda

1. Welcome!
2. Project Updates
3. Greenhouse Gas Reduction Best Practices (presentation)
4. Discussion



Project Updates

1. Existing Conditions and Future Conditions reports are available online
2. Stakeholder interview summary report is now published
3. Working on:
 - a. How things move - video
 - b. Perspectives on freight - video
 - c. Survey Infrastructure needs
4. Hiring public involvement support
5. Greenhouse Emission report

Project Updates

1. Review GHG reduction opportunities and best practices
2. Identify opportunities to reduce GHG emissions

2040 Portland Freight Plan: Freight Greenhouse Gas Reduction Best Practices



Content

1. **Climate Change Leadership and Previous Efforts**
Statewide Overview
2. **GHG Emission Opportunities and Best Practices**
3. **Potential City Strategies**

1. Climate Change Leadership and Previous Efforts

(Statewide Overview)



Climate Change Leadership and Previous Efforts

Statewide

- 2013 Oregon Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Emissions Reductions
- 2014 ODOT Statewide Transportation Strategy Implementation Plan
- ODOT Greenhouse Gas Reductions Toolkit Case Studies
- HB 2007 Phase-out 2007 or older diesel truck registration by 2025

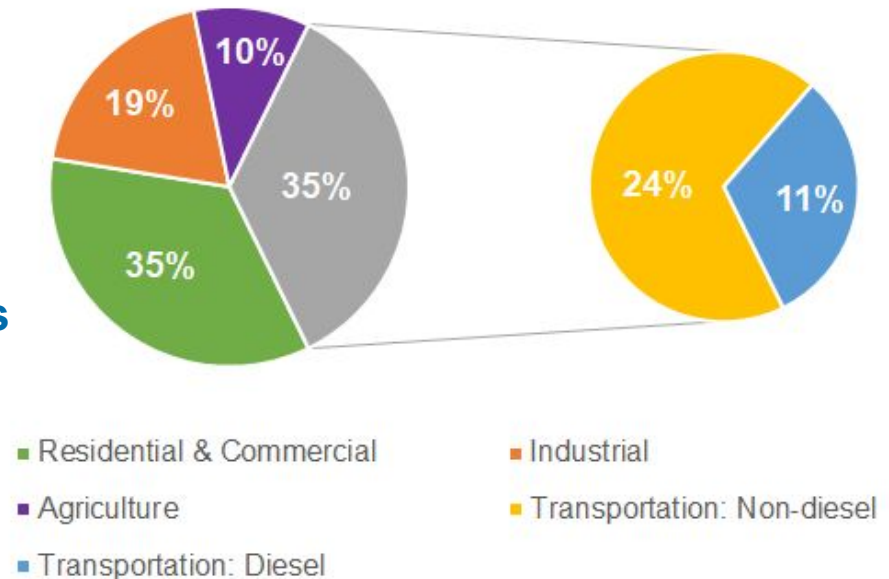
Portland

- 2012 City of Portland Central City Sustainable Freight Strategy
- 2015 Multnomah County and City of Portland Climate Action Plan
- 2017 City of Portland and Multnomah County Climate Action Plan Progress Report
- 2017 City of Portland Electric Vehicle Strategy
- 2020 City of Portland Climate Emergency Declaration
 - goal of 50% reduction by 2030 and 100% (net-zero) by 2050

Overview - Statewide

- In Oregon, transportation accounts for 35% of GHG emissions
- Freight transportation account for 11% of statewide GHG emissions, and 31% of transportation emissions
- Most freight transportation involves the movement of goods to, and from cities

Composition of 2019 GHG Emissions in Oregon



State of Oregon Department of Environmental Quality

2. GHG Emission Opportunities and Best Practices



GHG Emission Opportunities and Best Practices

Technology

- Clean vehicle technology & fueling infrastructure / supply
- Fuel efficient and idling reduction technologies

Management and Operations

- Off-peak delivery
- Lower emission modes for medium and long haul trips
- Loading/unloading areas
- Urban consolidation centers
- Last-mile solutions
- Low Emission Zone (LEZ)
- Off-street parking building requirements
- Share transit and freight lanes
- Congestion Pricing

Technology

Clean vehicle technology and fueling infrastructure - EVs

A rapid adoption of electric and hybrid commercial vehicles is expected.

Considerations

- Low production of electric trucks and long lead times
- 300-400% more expensive
- Current battery range is of 250-500 mi +
- Charging Infrastructure being built, but slowly



Tesla Electric Truck



Daimler Public EV Charging Station

Technology

Clean vehicle technology and fueling infrastructure – Alternative Fuel

- Natural gas, liquefied petroleum gas, hydrogen, propane, renewable diesel, renewable natural gas

Implementation examples:

- *Port clean truck programs:*
 - *Port of LA and Long Beach*
 - *tariffs or tenant requirements*
 - *Technology Advancement Program*



2008 Port of LA Clean Truck Program

Considerations

- Costs and uncertain adoption
- Refueling infrastructure/supply challenges

Overview - Trends in Trucking Operations

- **Purchase/Operation/Fuel = 56% of Truck Carrier costs**
- **15% used Alternative Fueled Trucks, + 5% increase since 2017**
 - > CNG 8.8%
 - > LNG 6.3%
 - > LPG 1.3%
 - > Battery 5%
 - > Hybrid 1.3%
- **In past 8 years, last-mile and regional truck trips grew while long haul trips declined**

Truck Operating Costs

	2019
Truck Purchase/Operation Costs	32%
Fuel Costs	24%
Driver Costs	42%

Source: *An Analysis of the Operational Costs of Trucking: 2020 Update*, American Transportation Research Institute, November 2020

Trip Types, 2011 to 2019 Comparison

	2011	2019	% Diff
Local pick-ups and deliveries (less than 100 miles)	19%	26%	+7%
Regional pick-ups and deliveries (100-500 miles)	36%	39%	+3%
Inter-regional pick-ups and deliveries (500-1,000 miles)	26%	22%	(4%)
National (over 1,000 miles)	19%	13%	(6%)

Source: *An Analysis of the Operational Costs of Trucking: 2020 Update*, American Transportation Research Institute, November 2020

Technology

Fuel Efficient and Idling Reduction Technologies (IRTs) for Trucks

Benefits

- Low-cost with high return on investment (improved MPG/reduced emissions)

Considerations

- In cab coaching to get to maximum efficiency.

Implementation examples:

- California technology mandates
- Voluntary EPA SmartWay Program



HVAC Hookup



Auxiliary Power Units



Tail flaps + side skirts + low rolling resistance tires

Management and Operations

Off-peak delivery

Programs that help shift deliveries to non-congested times.

Benefits

- Reduce congestion, emissions and competition for the curb

Considerations

- Success building trust with shippers
- Only workable for certain industries
- Potential changes in the cost structure



New York City Off-Hours Pilot

NYC off-peak pilot reduced delivery times by 75% and decreased delivery GHG emissions by 45%

Management and Operations

Lower emission modes for certain movements and commodities on long haul trips

Maritime

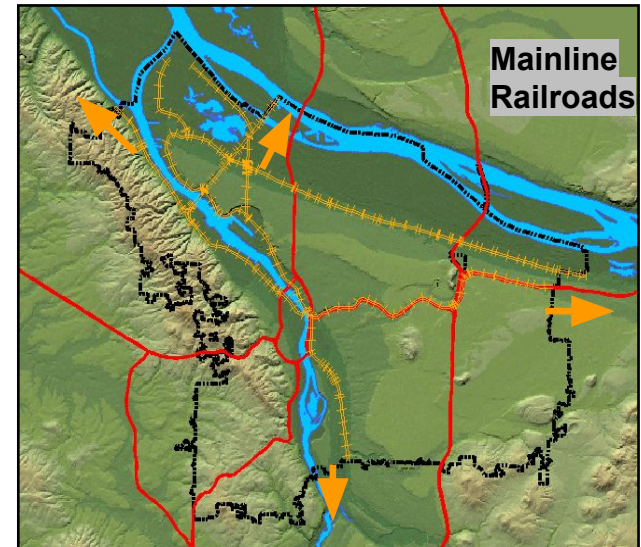
GHG emission are 13X lower than truck



Portland of Portland Facilities

Rail

GHG emission are 3X lower than truck



Regional Rail System

Management and Operations

Lower emission modes for long haul trips

- Rail is competitive on shipments longer than 500 miles.
- Maritime is competitive for trans-oceanic and low cost bulk cargoes.

Considerations

- Railyard emission during the assembly of the vehicle.
- At-grade rail crossings generate congestion and excess emissions of trucks and other vehicles.



At-grade rail crossing congestion



North Rivergate Boulevard Overcrossing

Management and Operations

Loading/unloading areas (delivery access & curb regulations)

Limited curb space leads CVs to:

- *cruising for adequate parking,*
- *unauthorized parking,*
- *traffic disruptions, and*
- *related safety risk.*

Potential solutions

Loading dock requirements, dynamic curb management, parking pricing, etc.

Benefits

- Reduces travel time, fuel consumption and emissions
- Improves operating efficiency



Unauthorized parking in San Francisco

Management and Operations

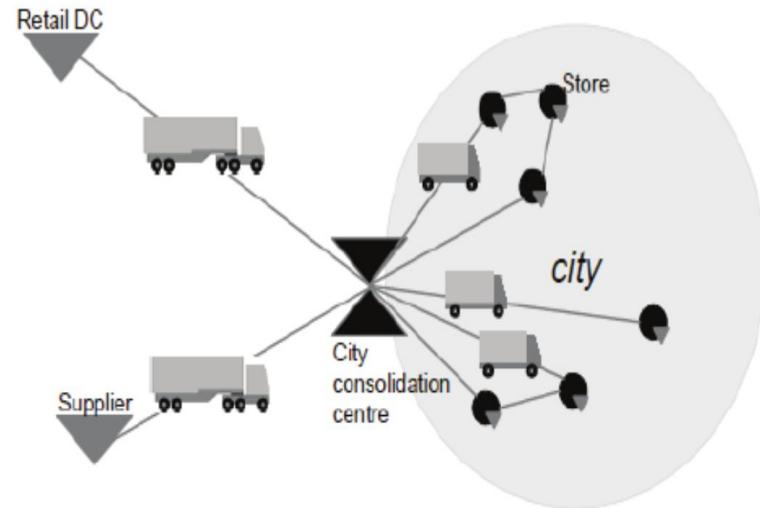
Urban consolidation centers

Benefits

- Reduces large vehicle trips and the number of trucks required
- Facilitates electrification
- Improves customer service of e-commerce,
- Replaces auto trips
- Reduces demand for parking

Considerations

- Increases transloading costs
- May increase VMT in local neighborhoods



Source: (Quak, 2008)

Management and Operations

Last-mile Solutions

Mode Shift

- ***Cargo bikes***
- ***Drones***
- ***Delivery Robots***

Micro hubs

Delivery Lockers and Alternatives Pickup points



UPS e-bike Seattle and Portland pilots

*A single electric cargo bike could save
13 tons per year in CO2 emissions.
(Conway, 2014)*



Portland locally owned B-line: pedal-powered cargo bike

Management and Operations

Last-mile Solutions

Mode Shift

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- ***Drones***
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Micro hubs

Delivery Lockers and Alternative Pickup points



UPS delivery drones



Amazon's new delivery robot

Management and Operations

Last-mile Solutions

Mode Shift

- ***Cargo bikes***
- ***Drones***
- ***Delivery Robots***

Micro hubs

Delivery Lockers and Alternative Pickup points



The Redd - Microhub located in the Central Eastside, Portland



UPS microhub: parcels are loaded onto a cargo bike

Management and Operations

Last-mile Solutions

Mode Shift

- ***Cargo bikes***
- ***Drones***
- ***Delivery Robots***

Micro hubs

Delivery Lockers and Alternative Pickup points



FedEx In-store pickup



Carriers lockers



Residential/offices building common delivery lockers

Management and Operations

Low Emission Zone (LEZ)

Around 200 worldwide examples, mostly in Europe

Benefits:

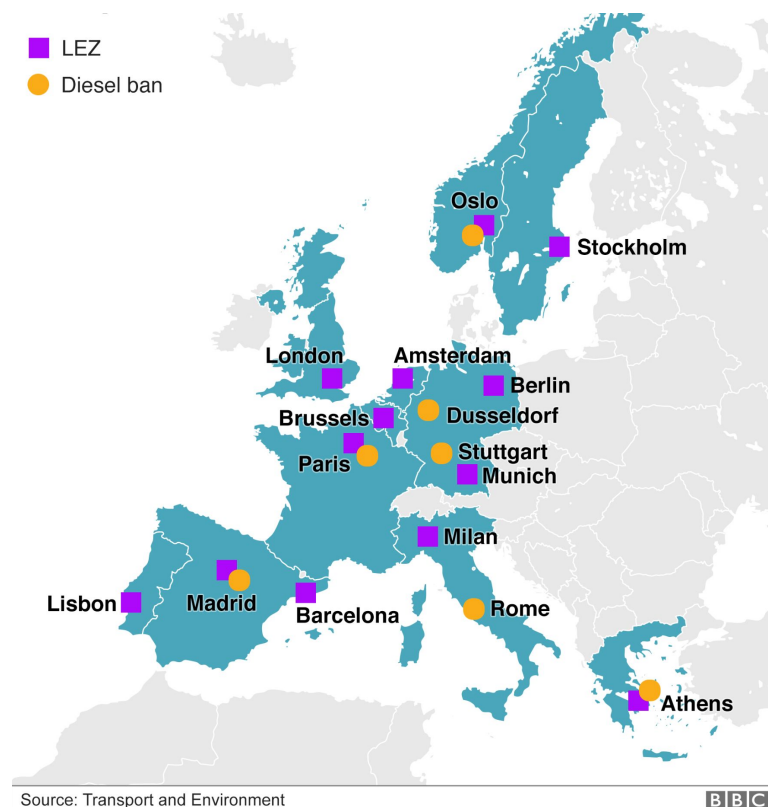
Effective in helping City's meet zero-emission goal

Considerations:

- Potential adverse impacts on local businesses and cost of delivery
- Increased VMT due to potential shift to smaller CVs or to increase circuitry to avoid the LEZ

Implementation examples:

- Santa Monica, CA. Zero Emissions Delivery Zone Pilot, first in nation



Major LEZ for vehicles in Europe
Source: BBC

3. Potential City Strategies



Potential City Strategies

Infrastructure and technology investment

- **Address transportation network operational and infrastructure inefficiencies: Improve efficiency of truck movements (*Climate Action Plan*)**
 - *information system on existing conditions and route alternatives*
 - *update curb management strategies*
 - *truck traffic signal priority and dedicated truck lanes on high volume routes*
 - *preserve and update freight routes*

Monitoring GHG mitigation

- **Integrate freight GHG performance measures, monitoring and evaluation in RTP**

Collaborative work

- **Establish working groups on vehicle technology / fueling, and last-mile Exchange**

Potential City Strategies

Funding & Incentives

- Facilitate financing for clean vehicle and fuel-saving technologies
- Leverage local/state/federal funding to support charging and refueling infrastructure, including reinvesting tax revenues

Regulations

- Consider anti-idling regulations

Policy: Clean technology

- Incentivize the use of clean vehicle and fuel-efficient technologies and best practices

Policy: Fueling infrastructure

- EV-Ready requirements for new freight facilities.
- Support development of alternative fuel supply facilities

Potential City Strategies

Policy: Operations

- Support and expand pilot programs and emerging technologies, including off-peak deliveries, parking pricing infrastructure, delivery lockers, micro-distribution centers
- Develop regulations/requirements for emerging technology in last-mile solutions (e-bikes, delivery bots, drones)

Policy: Demand Management

- Promote, support and provide guidance for the implementation urban freight consolidation concepts
- Implement pricing actions (parking and travel) to manage demand

Policy: Load/unload requirements

- Update land use and building codes to include adequate off-street delivery/service parking requirements



Q1. Which of these strategies should be considered as we move forward?

Q2. What other strategies should be considered?

Q3. Are there any obstacles to implementation of these strategies in the City of Portland?

Q3.a. Is there a way to overcome these obstacles?



**Wrap up
+
Next steps**